

Claims

1. A vortex-type filter assembly comprising:

 a housing having an inlet portion, a filtration chamber downstream from the inlet portion, and an outlet portion downstream from the filtration portion;

 an inlet module removably secured within the housing, separating the inlet portion from the filtration chamber, the inlet module having a vortex generating inlet passage through which a fluid flows from the inlet;

 an outlet module removably secured within the housing, separating the filtration chamber from the outlet portion, the outlet module having an outlet passage through which the fluid flows to the outlet portion, the outlet passage cooperating with the inlet passage for filtering debris from the fluid.

2. The vortex-type filter assembly described in claim 1 wherein the inlet module and outlet module is removable through the inlet portion of the housing.

3. The vortex-type filter assembly described in claim 2 wherein the inlet module is secured within the housing by a flange removably attached at the inlet portion of the housing.

4. The vortex-type filter assembly described in claim 3 wherein the inlet module further comprises an inlet plate separating the inlet portion from the filtration chamber, and the outlet module further comprises an outlet plate separating the filtration chamber from the outlet portion.

5. The vortex-type filter assembly described in claim 4 wherein the flange is removably attached to the housing by at least one over-center latch.

6. The vortex-type filter assembly described in claim 5 wherein the inlet module comprises a plurality of vortex generating inlet passages, and the outlet module comprises a plurality of outlet passages, there being one outlet passage cooperating with every one inlet passage for filtering debris from the fluid.

7. The vortex-type filter assembly described in claim 6 wherein the fluid is air.

8. The vortex-type filter assembly described in claim 1 wherein the inlet module and the outlet module are removable through an access panel removably attached to the housing.

9. The vortex-type filter assembly described in claim 8 wherein the inlet module

and the outlet module are removably secured within the housing by the access panel.

10. The vortex-type filter assembly described in claim 9 wherein the inlet module further comprises an inlet plate separating the inlet portion from the filtration chamber, and the outlet module further comprises an outlet plate separating the filtration chamber from the outlet portion.

11. The vortex-type filter assembly described in claim 10 wherein the access panel is removably attached to the housing by at least one over-center latch.

12. The vortex-type filter assembly described in claim 11 wherein the inlet module comprises a plurality of vortex generating inlet passages, and the outlet module comprises a plurality of outlet passages, there being one outlet passage cooperating with every one inlet passage for filtering debris from the fluid.

13. The vortex-type filter assembly described in claim 12 wherein the fluid is air.

14. A vortex-type filter assembly comprising:

- a housing having an inlet portion, a filtration chamber downstream from the inlet portion, and an outlet portion downstream from the filtration portion;

- an inlet module removably secured within the housing, separating the inlet portion from the filtration chamber, the inlet module having a vortex generating inlet passage through which a fluid flows from the inlet, the inlet module being removable through the inlet portion;

- an outlet module removably secured within the housing, separating the filtration chamber from the outlet portion, the outlet module having an outlet passage through which the fluid flows to the outlet portion, the outlet passage cooperating with the inlet passage for filtering debris from the fluid, the outlet module being removable through the inlet portion;

- a flange adapted to removably secure the inlet module within the housing, the flange removably attached to the housing at the inlet portion.

15. The vortex-type filter assembly described in claim 14 wherein the inlet module further comprises an inlet plate separating the inlet portion from the filtration chamber, and the outlet module further comprises an outlet plate separating the filtration chamber from the outlet portion.

16. The vortex-type filter assembly described in claim 15 wherein the inlet module is secured within the housing by a flange removably attached at the inlet portion of the housing.

17. The vortex-type filter assembly described in claim 16 wherein the inlet module comprises a plurality of vortex generating inlet passages, and the outlet module comprises a plurality of outlet passages, there being one outlet passage cooperating with every one inlet passage for filtering debris from the fluid.

18. The vortex-type filter assembly described in claim 17 wherein the fluid is air.

19. A method for servicing a vortex-type filter assembly, the vortex-type filter assembly comprising a housing, an inlet module, an outlet module, and a removable flange, the housing having an inlet portion, a filtration chamber downstream from the inlet portion, and an outlet portion downstream from the filtration portion, the inlet module separating the inlet portion from the filtration chamber, being removably secured within the housing, and having a vortex generating inlet passage through which a fluid flows from the inlet portion, the outlet module separating the filtration chamber from the outlet portion, and having an outlet passages through which the fluid flows to the outlet portion, the outlet passage cooperating with the inlet passage for filtering debris from the fluid, the flange being adapted to removably secure the inlet module within the housing, the inlet module being removable through the inlet portion of the housing, the flange being removably attached to the housing with a latch, the method comprising:

- unlatching the latch;
- separating the flange from the filter housing;
- removing the inlet module from the filter housing;
- cleaning the inlet module, filtration chamber, and outlet module;
- inserting the inlet module back into the filter housing;
- mating the flange to the filter housing;
- latching the latch.

20. A method for servicing a vortex-type filter assembly, the vortex-type filter assembly comprising a housing, an inlet module, an outlet module, and an access panel, the housing having an inlet portion, a filtration chamber downstream from the

inlet portion, an outlet portion downstream from the filtration portion, an inlet module position feature, and an outlet module position feature, the inlet module separating the inlet portion from the filtration chamber, being removably secured within the housing, and having a vortex generating inlet passage through which a fluid flows from the inlet portion, the outlet module separating the filtration chamber from the outlet portion, being removably secured within the housing, and having an outlet passage through which the fluid flows to the outlet portion, the outlet passage cooperating with the inlet passage for filtering debris from the fluid, the access panel adapted to removably secure the inlet module and the outlet module within the housing, through which the inlet module and the outlet module are removable, the access panel being removably attached to the housing with a latch, the method comprising:

- unlatching the latch;
- opening the access panel to reveal the filtration chamber;
- removing the inlet module and outlet module together from the housing;
- separating the inlet module and outlet module from one another;
- cleaning the inlet module, outlet module, and filtration chamber;
- inserting the outlet passage into the corresponding inlet passage;
- placing the inlet module and the outlet modules together into the housing;
- aligning the inlet module with the inlet module position feature;
- aligning the outlet module with the outlet module position feature;
- closing the access panel on the housing;
- latching the latch.